To: Jamie Howard, Ben Feider, Matt Drumheller, Greg Brooks, Jack Bryson

From: John Oberhelman

Subject: Little Goose Unit 1 Potential Oil Leak

Date: 19 Oct 2022

Meeting Attendees: Ben Feider, Brett Moon, Matt Drumheller, John Oberhelman

A meeting was held to discuss the potential oil leak on Unit 1 at Little Goose Lock and Dam. The discussion covered previous issues with Unit 1, current actions that are being taken and the path forward.

Brief history: Unit 1 changed the turbine blade seals and nose cone gasket during the 2020/2021 unit annual maintenance cycle. The nose cone gasket ordered was manufactured incorrectly, so it was decided to use a gar-lock seal in place of the o-ring. The unit was pressurized to conduct a leak check, which it passed and was placed back into service.

200 gallons of Oil was added to the governor sump on July 12th, 2022. It was believed that a valve in the governor drainage line to the dirty oil tank was leaking. The dirty tank indicated an increase in oil level similar to the amount added to Unit 1. No oil was added to the static oil head during this event, which led the project to believe there as a leaking valve. A decrease in the static oil head level is usually an indication of a loss of oil within the governor system. Oil was added to the on the following dates. 01 August 2022 (300 gallons) and 26 September 2022 (175 gallons).

Unit one was run at speed-no-load with employees placed outside the tailrace to see if there was an observable oil sheen. There was no observable sheen, but the Unit was taken out of service so a more in-depth survey of the turbine can be conducted to determine if an oil leak is present. Maintenance crews drained oil from the static oil head and observed an increase in the oil level without blade movement. This indicated a leak in the oil head system and hide the potential leak. This coupled with numerous oil moves initiated during unit annuals and a lack of oil monitoring totalizers within the system makes it extremely difficult to accurately monitor oil levels.

Current steps being taken:

Unit 1 is being un-watered to install the turbine platform to inspect for blade seal and nose cone leaks. If no obvious leaks are found, the governor oil system will be pressurized and inspected for oil leaks. The Project is anticipating completing this task by Monday 24 Oct. More information will be available at this time.

Path Forward:

District Operations Maintenance Section is sending an engineer to audit the oil system and make recommendations on improvements to better monitor oil transfers. The Project is reviewing Lower Monumental's governor oil monitoring / audit program. The project will take the appropriate actions if it is determined that oil has leaked into the river.

JPO

10/19/2022